

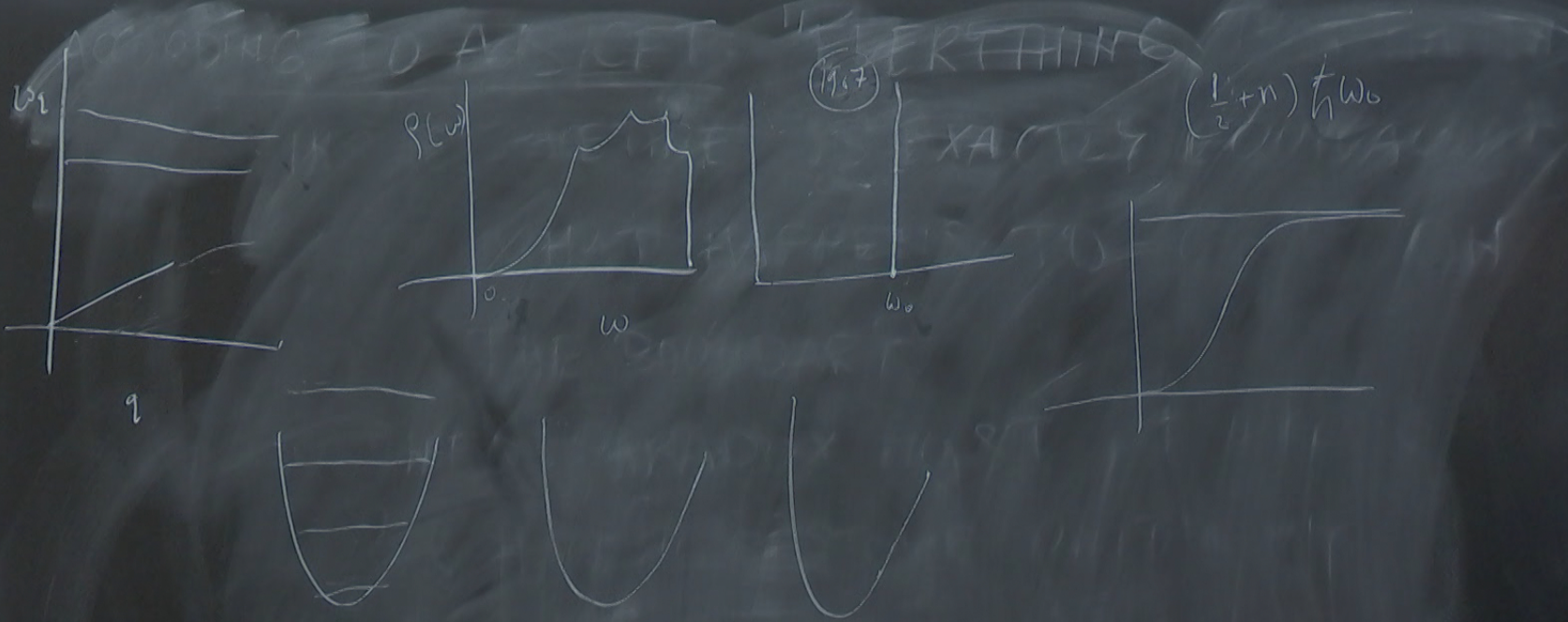
Title: Quantum Matter Lecture (230405)

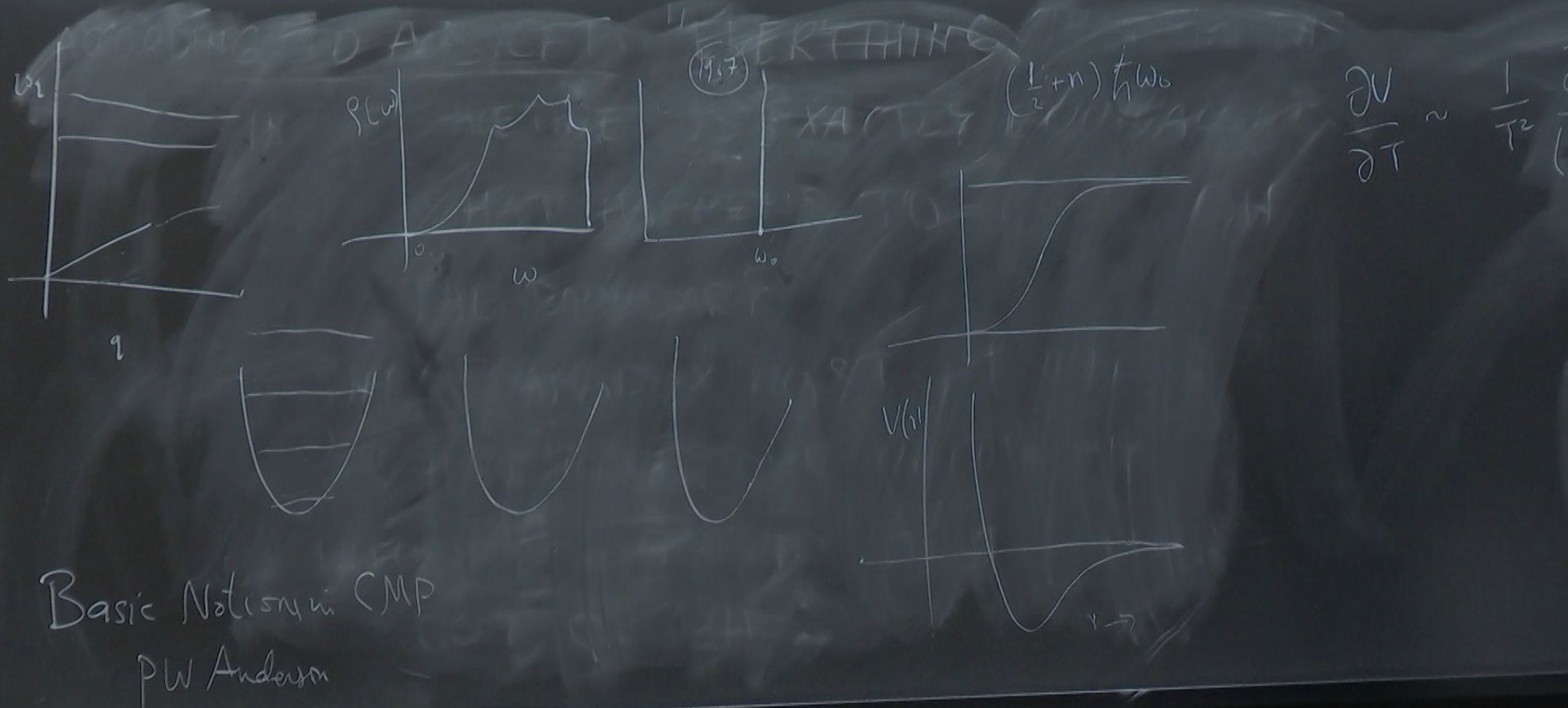
Speakers: Ganapathy Baskaran

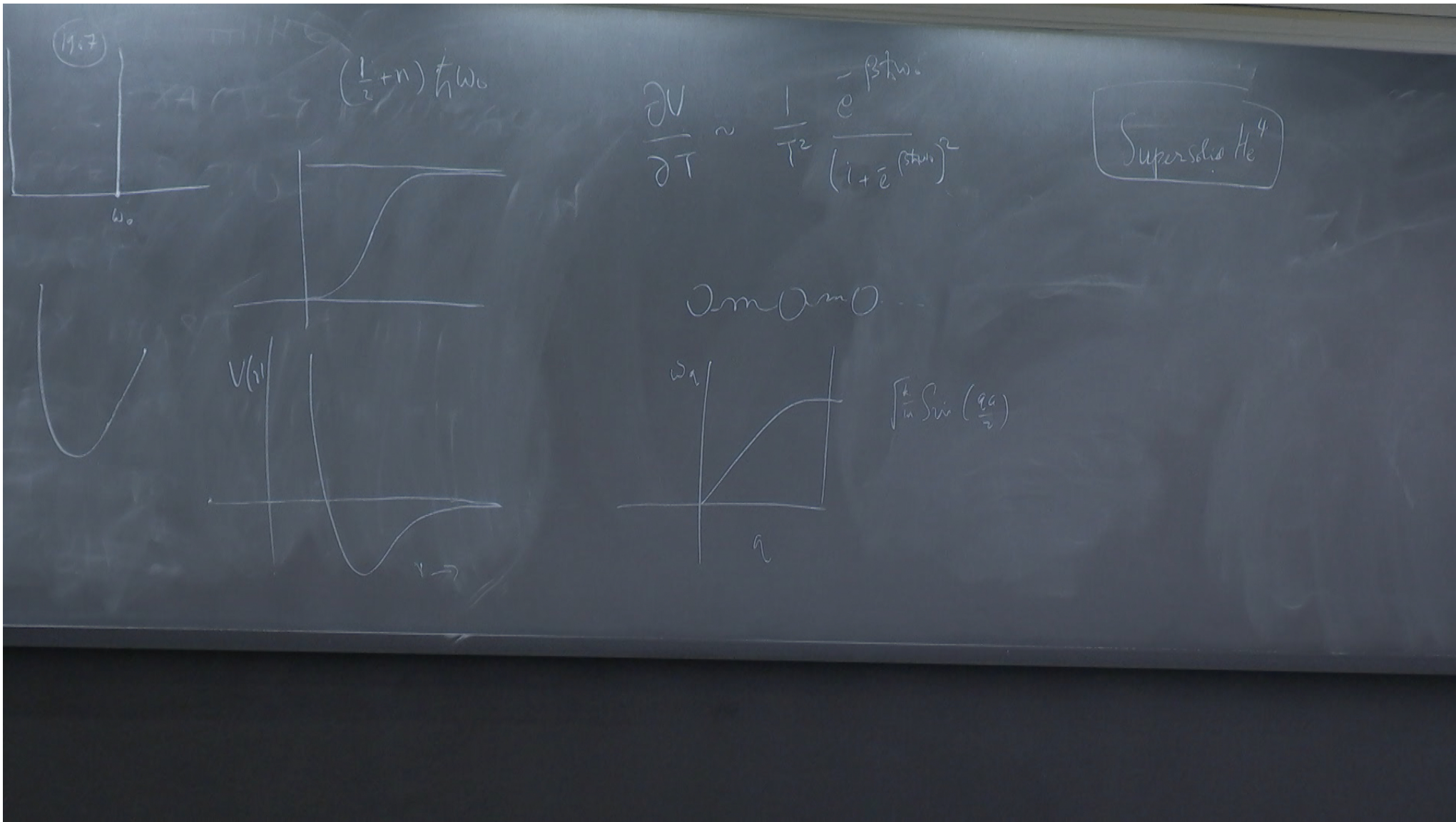
Collection: Quantum Matter (2022/2023)

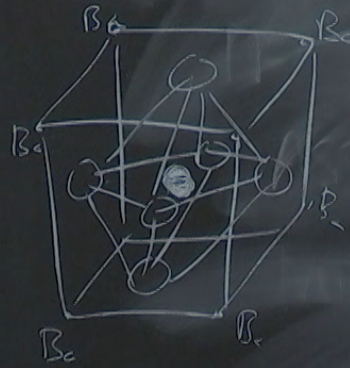
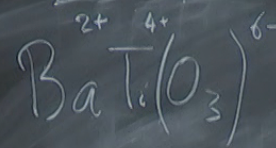
Date: April 05, 2023 - 10:15 AM

URL: <https://pirsa.org/23040007>

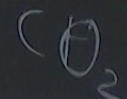
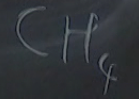
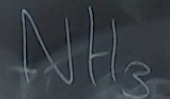
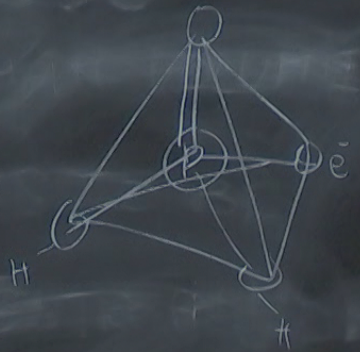
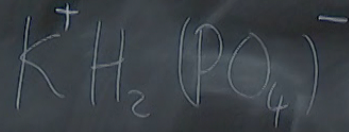
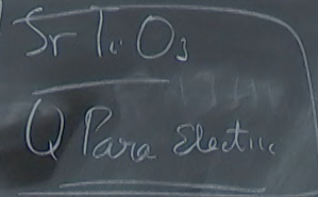


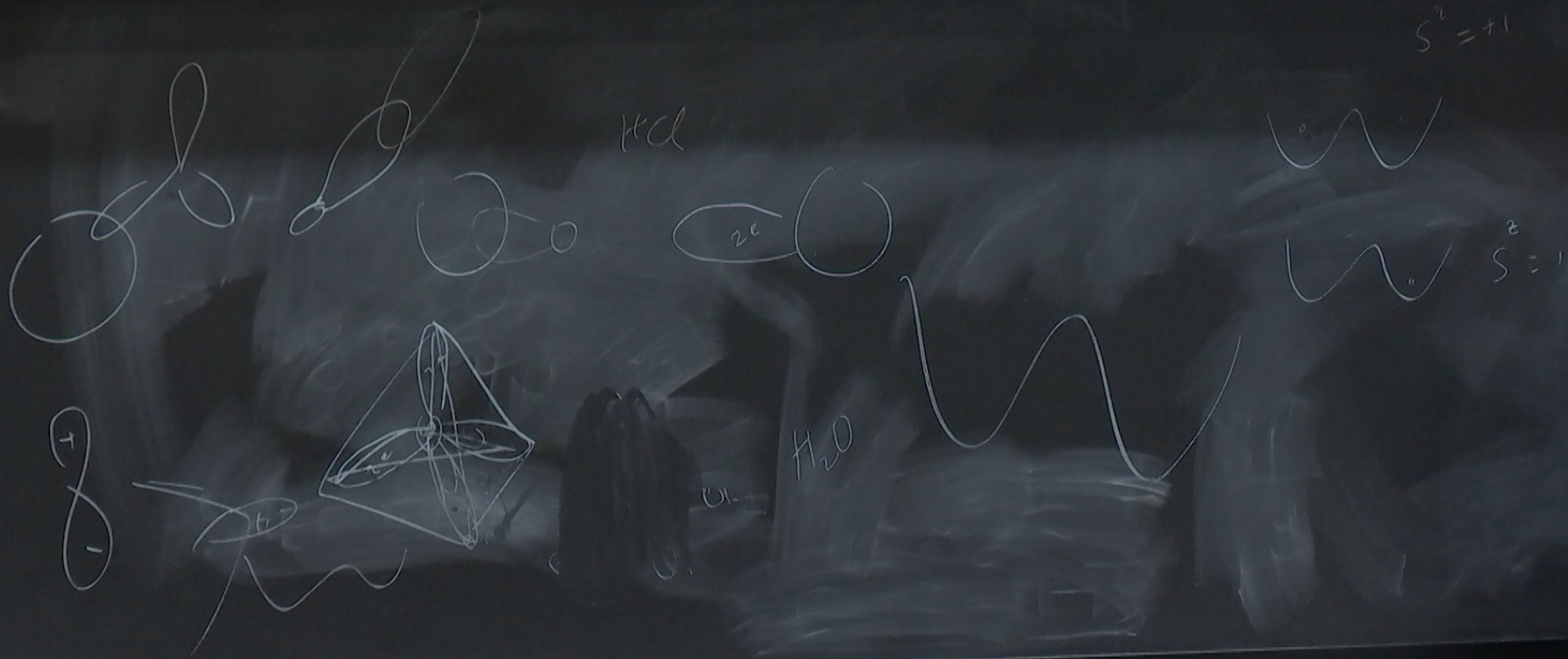






Polarization





$$\Delta(S_i^+ + S_i^-) = \Delta S_i^x$$

$$S = 1$$

$$|\uparrow\rangle + |\downarrow\rangle$$

$$|\uparrow\rangle - |\downarrow\rangle$$

$$\begin{pmatrix} 0 & \Delta \\ \Delta & 0 \end{pmatrix}$$

$$-J S_i^z S_{i+1}^z$$

$$\begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix}$$

$$S^2 = +1$$



$$S^2 = 1$$



$$\Delta(S_+ + S_-) = \Delta S_x$$

$$\begin{pmatrix} 0 & \Delta \\ \Delta & 0 \end{pmatrix}$$

$$|\uparrow\rangle + |\downarrow\rangle$$

$$|\uparrow\rangle - |\downarrow\rangle$$

$$H = -\Delta \sum_i S_i^x - J \sum_{i,j} S_i^z S_j^z$$

$$-J S_i^z S_{i+1}^z$$

Anderson

Q Para electric

KDP

$K^+ H_2 (PO_4)^-$

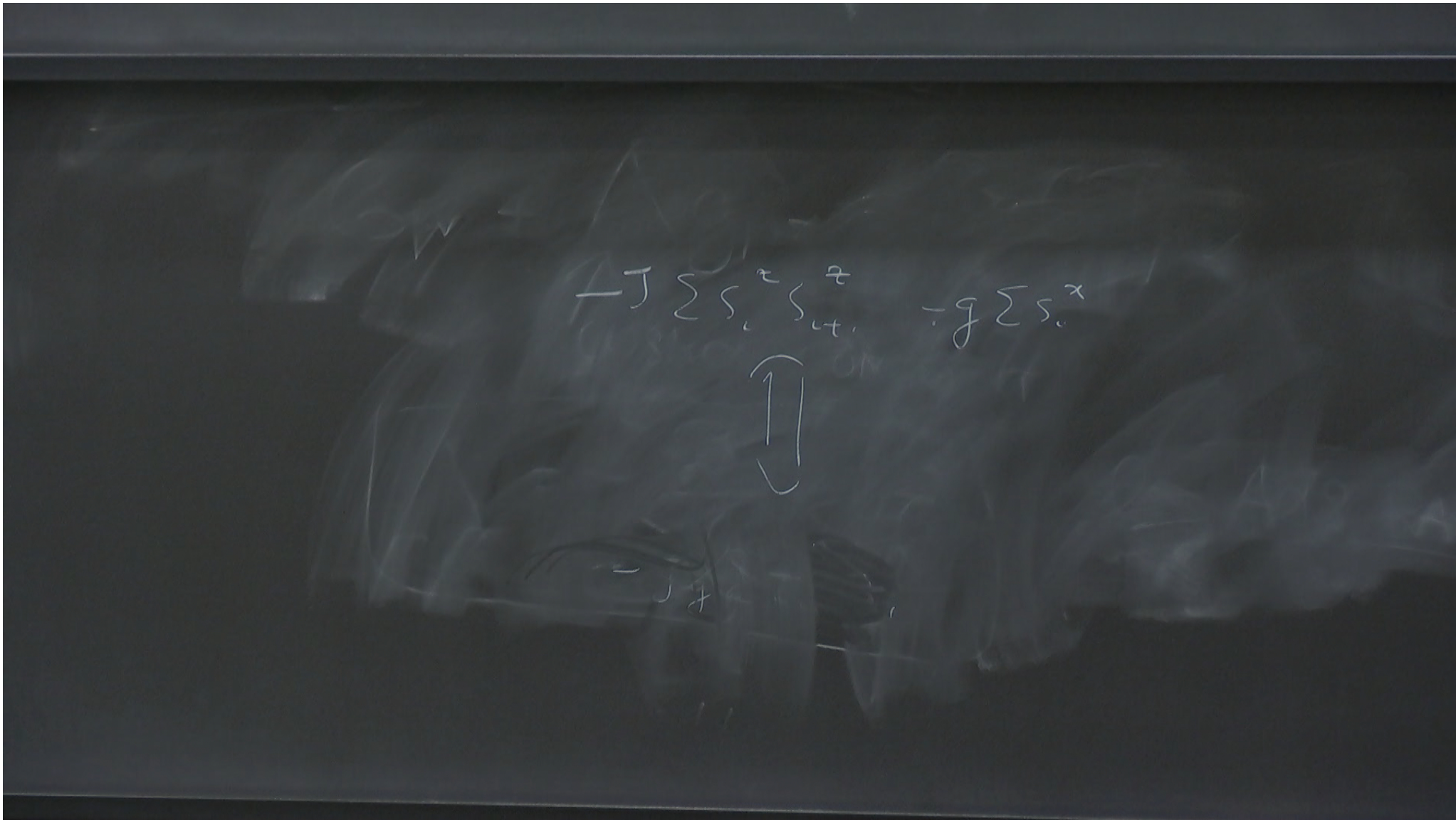
de Gennes

NH_3

CH_4

CO_2

$S^z = +1$



$$-J \sum_i s_i^z s_{i+1}^z - g \sum_i s_i^x$$



$$-J_g \sum_i \tau_i^z \tau_{i+1}^z - \frac{1}{g} \sum_i \tau_i^x$$

$$s_i^z s_{i+1}^z = \tau_i^z$$

